



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/990,844

11/21/2001

Thomas Klingenbrunn

01P15526US

2700

7590

08/23/2005

Siemens Corporation  
Attn: Elsa Keller, Legal Administrator  
Intellectual Property Department  
186 Wood Avenue South  
Iselin, NJ 08830

EXAMINER

WARE, CICELY Q

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/990,844	<b>Applicant(s)</b> KLINGENBRUNN ET AL.	
	<b>Examiner</b> Cicely Ware	<b>Art Unit</b> 2634	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11-14 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 8-10 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:
2. Pg. 12, line 3, applicant makes reference to a "Figure 9". Examiner asserts that no Fig. 9 was submitted. Examiner suggest applicant submit all drawings in correspondence with the specification for clarification purposes.

a. Pg. 12, line 24, applicant uses the phrase "can comprises a". Examiner suggests using "can comprise a" for clarification purposes.

Appropriate correction is required.

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. With regard to claims 1-4. Claim 1 recites the limitation "the calculation" in line 5. There is insufficient antecedent basis for this limitation in the claim. Examiner is unable to find what calculation applicant is referring to, the path metric calculations or some other calculation. Given that the path metrics are calculated in line 10 of Claim 1.

6. With regard to claims 19-21. Claim 19 recites the limitation "said select unit" in line 6. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 5, 6, 7, 11, 12 are rejected under 35 U.S.C. 102(a) as being anticipated by Traeber (US Patent 6,813,744).

(1) With regard to claim 5, Traeber discloses a method of determining a reduced trellis from a sequence of symbols in a Viterbi detector comprising the steps of: determining the value of a previous symbol from the sequence of symbols; and generating said reduced trellis by calculating only path metrics for states in which the previous symbol has the determined value (col. 2, lines 18-30).

(2) With regard to claim 6, claim 6 inherits all the limitations of claim 5. Traeber further discloses wherein the step of determining comprises the steps of: determining at least one symbol from a previous determination including a plurality of current states (Fig. 4, col. 1, lines 36-50, 31-34); determining destination states for the determined

symbol and determining a surviving path metric by comparing path metrics originating from the states of the determined symbol (Fig. 5, col. 2, lines 39-52, 62-67- col. 3, lines 1-10); and determining the value of a previous symbol with respect to the determined symbol of the surviving state (Fig. 5, Fig. 7, col. 3, lines 19-30).

(3) With regard to claim 7, claim 7 inherits all the limitations of claim 6. Traeber discloses in (Fig. 4) wherein the previous symbol is the oldest symbol (col. 2, lines 62-67 – col. 3, lines 1-10)

(3) With regard to claim 11, see rejection claims 5 and 6.

(4) With regard to claim 12, claim 12 inherits all the limitations of claim 11. Traeber further discloses in (Fig. 5 and 7 (ACS)) means for determining and said calculation means are implemented by a digital signal processor (col. 4, lines 40-60).

7. Claims 13 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Pirainen (US Patent Application 2003/005874).

(1) With regard to claim 13, Pirainen discloses an arrangement for determining a trellis from a sequence of symbols comprising: a plurality of equalizers receiving said sequence of symbols each generating a trellis (Pg. 1, col. 1, lines 32-46, col. 2, lines 36-40, Pg. 4, col. 2, lines 8-11); a select unit for activating one of the equalizers (Pg. 2, col. 2, lines 20-31, Pg. 3, col. 1, lines 43-47); a control unit receiving said sequence of symbols and for determining a power distribution of said sequence of symbols and controlling said select unit depending on said power distribution (Pg. 3, col. 2, lines 38-50, Pg. 4, col. 1, lines 4-9, 48-56, col. 2, lines 8-11).

(2) With regard to claim 19, see rejection of claim 13.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 14, 16-18, 20, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pirainen (US Patent Application 2003/0058974) as applied to claims 13 and 19.

(1) With regard to claim 14, claim 14 inherits all the limitations of claim 13. However Pirainen does not explicitly disclose a Viterbi equalizer receiving said sequence of symbols generating a first trellis; a tap-selectable Viterbi equalizer receiving said sequence of symbols generating a second trellis and a delayed decision feedback sequence estimator receiving said sequence of symbols generating a first trellis.

However Pirainen discloses a method of selecting an appropriate equalizer algorithm for any given situation, any channel quality and any coding scheme used and trellis calculations for each equalizer algorithm chosen (Pg. 4, col. 1, lines 4-9, col. 2, lines 8-13, 39-44).

(2) With regard to claims 16, claim 16 inherits all the limitations of claim 14. See rejection of claim 14.

(3) With regard to claim 17, claim 17 inherits all the limitations of claim 13. See rejection of claim 14.

(4) With regard to claim 18, claim 18 inherits all the limitations of claim 13. See rejection of claim 14.

(5) With regard to claim 20, claim 20 inherits all the limitations of claim 19. Pirainen further discloses a control unit determines which one of said plurality of equalizers will receive said sequence of symbols and generate a trellis to output (Pg. 4, col. 1, lines 4-9, col. 2, lines 8-13, 39-44).

(6) With regard to claim 21, claim 21 inherits all the limitations of claim 19. Pirainen further discloses a control unit determines which one of the trellis generated by said plurality of equalizers receiving said sequence of symbols is output (Pg. 4, col. 1, lines 4-9, col. 2, lines 8-13, 39-44).

### ***Allowable Subject Matter***

6. Claims 8-10, 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for indication of allowable subject matter: The instant application discloses a method of reducing the number of path metric calculations in the trellis of a Viterbi equalizer receiving a sequence of symbols. Prior art references show similar methods but fail to teach: **“wherein the sequence comprises n symbols and said previous symbols are a sub-sequence of n-1 symbols and said preliminary decision of at least one symbol comprises a sub-sequence of up to the last n-2 symbols”**, as in claim 8; **“wherein said method is executed depending on power**

**distribution”, as in claim 9; “wherein the sequence comprises n symbols and said previous symbols are a sub-sequence of n-1 symbols and said preliminary decision of at least one symbol comprises a sub-sequence of up to the last n-2 symbols and wherein the power distribution of said n-2 symbols is below a predefined threshold”, as in claim 10; “means for determining at least one symbol from a previous determination assigned to a first state”, as in claim 15.**

### ***Conclusion***


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

***Cicely Ware***

cqw  
August 22, 2005

  
**STEPHEN CHIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600**